

## CLAIMS

1. A method of determining the depletion of Al and Cr of a  $\gamma/\gamma'$  MCrAlY-coating after the use in a high temperature environment, the  $\gamma/\gamma'$  MCrAlY-coating applied to a component exhibiting a non-equilibrium  $\gamma/\gamma'$ -microstructure at a temperature lower than the temperature during operation, the method comprising the steps of
  - (a) applying a defined annealing heat treatment to the  $\gamma/\gamma'$  MCrAlY-coated component to transform the non-equilibrium high temperature  $\gamma/\gamma'$ -microstructure into the equilibrium room temperature microstructure with a  $\alpha$ -Cr phase,
  - (b) measuring the coating electrical conductivity and magnetic permeability of the MCrAlY-coating by means of a multi-frequency eddy current system and
  - (c) determining the Al and/or Cr depletion of the coating from the coating conductivity and permeability.
2. The method according to claim 1, wherein from the Al and/or Cr depletion of the coating the remaining life-time of the coating is determined.
3. The method according to any of the claims 1 to 3, wherein the method is applied for a coating consisting of (wt.-%) 25% Cr, 5.5% Al, 1% Ta, 2.6% Si, 0.5%Y, Rest Ni and unavoidable impurities.
4. The method according to any of the claim 1 or 4, wherein a transformation heat treatment at a temperature of 800° - 870° C for 16 to 24 h is applied.
5. The method according to any of the claim 1 or 4, wherein after the operation the coating is heat treated with a temperature above 1000°C for at least 2 hours with a subsequent controlled cooling rate of 2-10K/min from the heat treatment temperature down to below 800°C to transform the microstructure.